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# CHARACTERIZATION OF WHALE-WATCHING ACTIVITY IN MADEIRA ARCHIPELAGO (SE NORTH ATLANTIC), PORTUGAL



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## INTRODUCTION

Whale-watching industry is growing rapidly worldwide, offering several advantages, at an educational, environmental, scientific and socio-economic level (Hoyt, 2000, 2005). In Madeira Archipelago there are 21 cetacean species, occurring frequent or occasionally (Freitas *et al.*, 2004) which are targeted by the whale-watching activity. It is mainly done in a non-dedicated manner, ruled by a voluntary code of conduct proposed by the Madeira Whale Museum.

## AIMS

To characterize the whale-watching activity in terms of: operating boats, tourists and cetacean species targeted, before the implementation of legislation.

## METHODS

- Observations were made on the south coast of Madeira Island, **land-based** using Steiner® binoculars 15x80 and 25x80, and **boat-based** through opportunistic trips on whale-watching boats. Data was collected between January and September 2007, adding up to 500 hours of observation effort.
- Data regarding **boats' characteristics** were compiled and estimates of the monthly number of tourists (medium number of tourists x number of trips/month) and the capital involved (monthly number of tourists x trip's price) were made.
- Questionnaires** evaluating the environmental awareness of the tourists were conducted.
- The frequency of **occurrence of cetaceans** in the study area was estimated.

## RESULTS & DISCUSSION

### Boats' characteristics

- 10 boats**, presenting different characteristics (table I), operate in Madeira Island.
- Only **2 of the boats** (Cetáceos I and II) are **exclusively dedicated to whale-watching** while the others are engaged in sightseeing trips with non-dedicated whale-watching.

Table I. Characteristics of whale-watching boats operating in Madeira Island in 2007. (n.d.= not determined)

| Name                     | SeaBorn          | SeaPleasure     | ZonaCat         | Nau Sta. Maria  | Ventura        | Gavião          | Bonita da Madeira | Ribeira Brava   | Cetáceos I and II |
|--------------------------|------------------|-----------------|-----------------|-----------------|----------------|-----------------|-------------------|-----------------|-------------------|
| Type                     | Catamaran        | Catamaran       | Catamaran       | Sailboat        | Sailboat       | Sailboat        | Sailboat          | Fishing boat    | Semi-rigids       |
| Lenght (m)               | 22,86            | 19,50           | 18,15           | 22,30           | 14,70          | 13,10           | 20,70             | 12,00           | 8,50              |
| Width (m)                | 10,50            | 10,00           | 9,07            | 7,00            | 4,20           | 3,66            | 6,20              | 4,00            | 2,95              |
| Capacity (nr. persons)   | 100              | 70              | 40              | 100             | 18             | 20              | 46                | 20              | 12                |
| Nr. Engines              | 2                | 2               | 2               | 1               | 1              | 1               | 1                 | 1               | 2                 |
| Engines' characteristics | 170 HP, inboards | 62 HP, inboards | 62 HP, inboards | 455 HP, inboard | 83 HP, inboard | 140 HP, inboard | 355 HP, inboard   | 211 HP, inboard | 150 HP, outboards |
| Date of construction     | 2004             | 2004            | n.d.            | 1998            | 1965           | 1997            | 1996              | 1964            | 2007              |
| Start of the activity    | 2004             | 2004            | 2004            | 2001            | 2003           | 2003            | 2003              | 2004            | 2007              |

- The predominant use of inboard engines presents advantages minimizing the production of noise, since the sounds are less intense and thus reducing the disturbance on the animals (Au & Green, 2000).

### Cetacean Species

- 10 species** were sighted (9 through land-based observations, fig. 1), with small delphinids and Bryde's whales being the most sighted by the whale-watching boats.
- Occurrence of bottlenose dolphins, *Tursiops truncatus*, and short-finned pilot whales, *Globicephala macrorhynchus*, throughout the study period is consistent with Freitas *et al.* (2004).
- Contrary to the previous study was the presence of Atlantic spotted dolphins, *Stenella frontalis*, in winter months.
- Bryde's whales, *Balaenoptera brydei*, are also an exception, since their presence is becoming more frequent throughout the years.

### Number of tourists and income

- Estimates in 2003/2004: 40 000 tourists/year (Freitas *et al.*, 2004).
- Current estimates: around **58 000 tourists/2007** income of **1.5 million euros**.

### Questionnaires

Table II. Questionnaires conducted to 58 tourists, regarding their encounters with cetaceans in a total of 44 whale-watching trips in Madeira Island.

| Questions                                                 | Yes | No  |
|-----------------------------------------------------------|-----|-----|
| Did you wish to be longer with the animals?               | 57% | 43% |
| Did you wish to be closer to the animals?                 | 41% | 59% |
| Do you think whale-watching does any harm to the animals? | 19% | 81% |

- Current results showed that **tourists desired to have a higher and longer contact with cetaceans** and **did not perceive the impacts** that whale-watching can cause on the cetaceans observed (Table II), contrary to studies made in Tangalooma, Australia by Orams (2000) and in West Scotland by Parsons *et al* (2003).

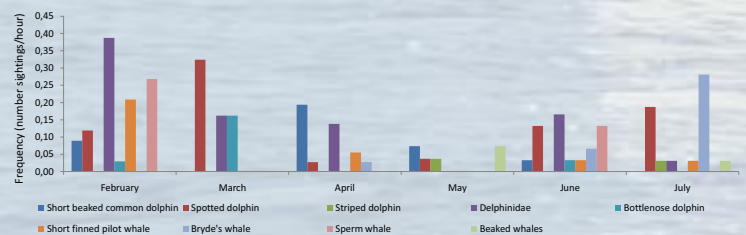


Fig. 1. Frequency (number sightings/hour) of the observed species from a land-based station, from February to July 2007 in Madeira Island.

## FINAL REMARKS

- Although whale-watching in Madeira Archipelago assumes a relevant economic and touristic role, it is still mainly done in a non-dedicated manner.
- A continuous collaboration between whale-watching operators and research investigators in Madeira Archipelago potentiates the environmental education role that this industry should have and that is significant for the tourists engaged in the activity and for the targeted animals.